

Claims

- [c1] **Apparatus for use in well operations, comprising:
a downhole tool having a thermal coating.**
- [c2] **The apparatus of claim 1, wherein the downhole tool is a
perforating gun.**
- [c3] **The apparatus of claim 2, wherein the perforating gun
comprises:
a hollow carrier,
wherein the thermal coating surrounds the hollow car-
rier.**
- [c4] **The apparatus of claim 2, wherein the perforating gun
comprises:
a loading tube,
wherein the thermal coating surrounds the loading tube.**
- [c5] **The apparatus of claim 4, wherein the loading tube is
fabricated from metal.**
- [c6] **The apparatus of claim 4, wherein the loading tube is
fabricated from pulp paper.**
- [c7] **The apparatus of claim 4, wherein the loading tube is
fabricated from plastic.**

- [c8] The apparatus of claim 4, wherein the loading tube is fabricated from polystyrene.
- [c9] The apparatus of claim 2, wherein the perforating gun comprises:
 - a shaped charge,
 - wherein the thermal coating surrounds the shaped charge.
- [c10] The apparatus of claim 9, wherein the shaped charge is a capsule charge.
- [c11] The apparatus of claim 9, wherein the shaped charge is a non-capsule charge.
- [c12] The apparatus of claim 2, wherein the perforating gun comprises:
 - a propellant,
 - wherein the thermal coating surrounds the propellant.
- [c13] The apparatus of claim 1, wherein the downhole tool is a tubing cutter.
- [c14] The apparatus of claim 13, wherein the tubing cutter comprises:
 - a housing,
 - wherein the thermal retardant coating surrounds the housing.

- [c15] The apparatus of claim 13, wherein the tubing cutter comprises:
 - a shaped charge,
 - wherein the thermal coating surrounds the shaped charge.
- [c16] The apparatus of claim 1, wherein the downhole tool is a detonator.
- [c17] The apparatus of claim 16, wherein the detonator comprises:
 - an exploding foil initiator,
 - wherein the thermal coating surrounds exploding foil initiator.
- [c18] The apparatus of claim 16, wherein the detonator comprises:
 - an exploding foil initiator;
 - a capacitor discharge unit in connection with the initiator;
 - an initiator board in connection with the capacitor discharge unit;
 - a processor in connection with the initiator board; and
 - a battery in connection with the initiator board,
 - wherein the thermal coating surrounds the exploding foil initiator, the capacitor discharge unit, the initiator board,

the processor, and the battery.

- [c19] The apparatus of claim 1, wherein the downhole tool is a detonating cord.
- [c20] The apparatus of claim 1, wherein the downhole tool is an explosive actuator.
- [c21] The apparatus of claim 1, wherein the thermal coating is a thermal intumescent coating.
- [c22] A perforating gun for use in a wellbore, comprising:
 - a shaped charge containing an explosive;
 - a loading tube for holding the shaped charge; and
 - a hollow carrier for carrying the loading tube into the wellbore,wherein the shaped charge is surrounded by a thermal coating.
- [c23] The perforating gun of claim 22, wherein the loading tube is surrounded by a thermal coating.
- [c24] The perforating gun of claim 23, wherein the hollow carrier is surrounded by a thermal coating.
- [c25] A method of protecting a downhole tool for use in a well, comprising:
 - applying a thermal coating to the downhole tool.

- [c26] Apparatus for use in holding a downhole tool, comprising:
 - a container having an outer surface and defining an inner volume to receive the downhole tool; and
 - a thermal coating applied to the outer surface of the container.
- [c27] Apparatus of claim 26, further comprising:
 - packing material adapted to secure the downhole tool within the inner volume of the container, the packing material having a thermal coating.
- [c28] Apparatus for use in securing a downhole tool, comprising:
 - packing material adapted to surround the downhole tool in a container, the packing material having a thermal coating.
- [c29] A method of protecting a downhole tool, comprising:
 - providing a container to hold the downhole tool;
 - applying a thermal coating to the container; and
 - placing the downhole tool within the container.
- [c30] The method of claim 29, further comprising:
 - providing a packing material to secure the downhole tool in the container;
 - applying a thermal coating to the packing material; and

positioning the packing material around the downhole tool within the container.

- [c31] A method of protecting a downhole tool, comprising:
 - providing a packing material to secure the downhole tool in a container;
 - applying a thermal coating to the packing material; and
 - positioning the packing material around the downhole tool within the container.